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Conceptualizing Creative Use: An Examination of the Construct and its Determinants

Annette Mills

Wynne Chin
University of Canterbury

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Conceptualizing Creative Use:

An Examination of the Construct and its Determinants

ABSTRACT

Organizations depend on the creativity of their employees in order to get the best possible outcome from the technologies that have been put into place. Yet IT research exhibits few studies in understanding the types of behaviors that yield new and useful ways of using organizational systems. This research therefore examines the creative use of technologies by individuals, that is, the implementation of novel and useful ways of applying organizational systems to solving business problems. Drawing on a well-established body of literature on creativity/innovation, a theory-based conceptualization of creative use is developed. Creative use is then assessed as the dependent variable in the context of Bandura's (1986) self-efficacy theory, which posits the necessity of domain-related self-efficacy and knowledge as prerequisites for creative use. The results support the theorized model and further suggest that breadth of knowledge is the most influential for creative use.

Introduction

Organizations in the 21st century depend on the creativity and innovation of their employees to survive and be successful. Creativity in using organizational systems goes beyond the notion of simply using of a technology in a prescribed way, to finding new ways of using that technology to accomplish goals. Creativity is therefore one of the most important factors influencing organizational innovation and its ability to transform its technologies into new and useful processes that optimize the firm's investments. How users employ existing technologies is essential to organizational innovation and enhanced performance, yet it is vastly under-researched.

The concept of system use has dominated IS literature for three decades. Over this time, system use has been conceptualized in many different ways across the domains of IS acceptance, IS implementation, IS success, and IS for decision-making (Burton-Jones & Straub, 2006). However much of this work focuses on pre-adoption behaviors such as intention to use and initial use. With few studies considering post-adoption behaviors, there have been calls for closer scrutiny of the use phenomenon and to examine different types of post-adoption use (Chin & Marcolin, 2001; Jaspersen et al., 2005).

This research therefore examines a specific type of post-adoption use - the 'creative use' of information technologies (IT) which is defined as *the implementation of novel ways of employing one or more features of a system to perform a task*. The creative use of organizational IT (whether newly adopted or long-standing technologies) is an important determinant of task performance and may exert a significant effect on organizational processes. The creative use of

IT by individuals is therefore posited as a necessary precondition for organizational innovation with IT. Grounded in the creativity/innovation literature and IS literature on technology use, the notion of creative use is linked with concepts such as *trying to innovate with IT*, *intention to explore* and *propensity to innovate* (Ahuja & Thatcher, 2005; Nambisan et al., 1999). However, these are pre-implementation concepts, while creative use is about post-implementation use. Post-implementation concepts such as enactment of change and technology adaptation (Majchrzak et al., 2000; Orlikowski, 2000) are also linked to notions of creative use, but these emphasize process rather than product.

This paper therefore proceeds as follows. First we briefly review the state of IS research on post-adoption use. Next, we present our theory-based conceptualization of creative use drawing on the creativity/innovation literature to inform construct choice and definition. Creative use is then assessed within a framework of antecedents derived from the IS domain, creativity research, and Bandura's (1986) treatise of self-efficacy. Finally, the results are reported and discussed.

Literature Review

System use at the individual level refers to *an individual's employment of one or more features of a system to perform a task* (Burton-Jones & Straub, 2006). Much of the research on system use focuses on pre-adoption behaviors such as intention to use and initial use (Jasperson et al., 2005). Only a small proportion examines post-adoption behaviors such as continuance (Bhattacharjee, 2001), technology adaptation (Majchrzak et al., 2000), and technology incorporation including reinvention (Boudreau & Robey, 2005), routinisation (Sundaram et al., forthcoming), and infusion (Jones et al., 2002). Where research does examine post-adoption use, such work often assumes that the factors impacting pre-adoption use are relevant in post-adoption (Karahanna et al., 1999; Jones et al., 2002). But the evidence suggests that post-adoption use takes very different forms. For example, the conceptualization and operationalization of post-adoption behaviors such as infusion is very different from the simpler use/non-use behaviors and frequency of use measures that characterize pre-adoption studies (Jones et al., 2002). Infusion research also shows that the factors linked to infusion are not necessarily the same or may exert a different level of influence when compared with adoption/initial use. Studies on post-adoption will therefore require researchers to reconsider what constitutes use and rethink the factors and models that explain use (Chin & Marcolin, 2001), taking care not to rely on an omnibus approach to modeling use.

Before we explain creative use, we examine prior work on creativity/innovation, drawing on the literature as theoretical grounding for conceptualizing creative use.

Creativity/Innovation

Creativity can be defined as the production of novel and useful ideas by individuals or groups (Amabile et al., 1996). Focusing on creativity as idea-generation IS researchers have examined

idea-generation techniques (Garfield et al., 2001; Cooper, 2000; Couger et al., 1993); individual attributes such as personal innovativeness and creative style (Agarwal & Prasad, 1998; Gallivan 2003); and the organizational mechanisms (Nambisan et al., 1999) that support creativity. But, despite these activities in the last decade, and calls for further attention to individual creativity (Couger et al., 1993), research on IS-related creativity remains sparse.

Outside the IS domain, thousands of papers have been published on creativity. This wide body of research converges on four streams: the creative *person* focusing on characteristics and personality traits, the creative *process*, the creative *product*, and the creative *environment* (Amabile, 1996). Creativity is therefore a diverse multifaceted construct. However, most researchers adopt the product view when conceptualizing creativity. In its simplest form, creativity can therefore be defined as "*novelty* that is *useful*" (Stein, 1974). In addition to idea-generation, some researchers consider another dimension when defining creativity, that is, implementation or development of the idea to the full. Here, MacKinnon (1962) takes the view that true creativity has three characteristics: (i) it involves an idea that is *novel*; (ii) the idea must solve a problem, fit a situation or accomplish a recognizable goal - in other words the idea must be *useful*; and (iii) creativity includes sustaining, evaluation and elaboration, or development of the idea to the full - in other words, a creative idea is one that can be *put into action*.

Turning to innovation research, most of the work here emphasizes the *creative idea* as the key element, and is therefore similar to the product view of creativity. Hence, an innovation is broadly defined as any idea, practice or object that is perceived as new by an individual or the relevant unit of adoption. An innovation may therefore be the outcome of recombining old ideas, a proposal that challenges the current way of doing things, a formula or a unique approach (Rogers, 2003; Zaltman et al., 1973). Whether the idea is objectively new or not, has little impact as far as human behaviors are concerned; what matters most is that the idea is *perceived* as new by the individual, group or organization (Rogers, 2003).

Most definitions of innovation will go beyond the development of new ideas to include implementation that is, *putting the idea into use*. For example, Van de Ven (1986) defines innovation as "the development and implementation of new ideas by people", while Kanter (1983) defines innovation as the process of bringing new, problem-solving ideas into use... Innovation is the generation, acceptance, and implementation of new ideas, processes, products or services". It is therefore widely accepted among innovation theorists that implementation is indispensable when the innovation takes place within an organization (Zaltman et al., 1973). Amabile (1988, p.126) therefore referred to an organizational innovation as "*the successful implementation of creative ideas within an organization*", using the term 'implementation' in the broader sense to include development and implementation of the creative idea. This twofold notion of innovation in organizations most closely aligns with McKinnon's view of creativity, that is, novelty that is useful and has been developed to the full.

Creativity in organizations therefore involves both the development of new ideas or new ways of doing things and implementation that is, *putting the idea into use*. While the phase of idea development underpins behaviors such as propensity to innovate and trying to innovate (Ahuja & Thatcher, 2005; Nambisan et al., 1999), these behaviors, as they are conceptualized, fall short of implementation. But as we have established so far, the type of creativity that is most relevant to an organization, must go beyond idea-generation and development to putting the idea into use.

It can therefore be said that in respect of system use, creativity is most evident when an individual (i) generates new ideas about how a system (or particular system features) can be used and (ii) these ideas are put into use in the organization. In adopting the position that creativity exhibits *novelty* that has been put into action (MacKinnon, 1962; Zaltman et al., 1973; Amabile 1988), this means that the creative product cannot be truly studied, in the organizational context while it is still an idea. Creativity is therefore best studied as a post-implementation phenomenon when the idea has been put into use (MacKinnon, 1962). This position also means that concepts such as trying to innovate with IT and personal innovativeness while useful indicators of one's *creative potential* (Mumford & Gustafson, 1988), are not suitable surrogates for assessing the type of individual creativity (which occurs in organizations) that we have described here. Next, we define creative use.

Creative Use

Technology innovation in organizations typically begins with the initial use stages of adoption and commitment. As individuals gain experience using technology, they may find ways of using it that go beyond intended applications. However, this engagement in feature extension behaviors (Jaspersen et al., 2005) is not necessarily creative by nature - it only becomes creative when the 'other ways of applying the technology' exhibit *novelty*.

Drawing on creativity/innovation theory and IS research on system use we define the ***creative use*** of a system or technology by an individual as:

the implementation of novel ways of employing one or more features of a system to perform a task.

This view of creative use embodies generation and development of the creative idea as well as *implementation*.

Although the terms 'creativity' and 'innovation' are often mentioned in the IS literature, we are unaware of any work that has sought to theorize a creative use construct. While IS researchers have examined related concepts such as trying to innovate with IT (Ahuja & Thatcher, 2005), intention to explore/propensity to innovate (Nambisan et al., 1999) and personal traits such as personal innovativeness (Agarwal & Prasad, 1998), these focus on idea generation - finding new ways to do things. These concepts therefore differ from creative use, which is a post-

implementation concept that incorporates 'putting the creative idea into action' as a necessary condition of true creativity. In this sense, creative use may also be regarded as a post-evaluation concept that can only be recognized and assessed after the creative idea has been used in the organization¹. Indeed, it may also be the case that, it is only after implementation and evaluation of the idea, that creative use can be distinguished from other types of feature extension behaviors.

Like feature extension behaviors, concepts such as enactment of change and technology adaptation also embody a post-implementation view of creativity. Based on structuration theory, these concepts view technology use as a process through which users, drawing on their social context, change how they use a technology (Orlikowski, 2000; Majchrzak et al., 2000). For example, over time, users may come to use a technology in ways that go beyond or contravene design intentions, or they may implement new or alternative ways of working, or they may modify existing conditions (such as work practices, social structures, or technology features) to achieve alignment. However, creative use can be distinguished from these types of technology use that concentrate on enactment of change and technology adaptation. While creative use emphasizes product, enactment of change and technology adaptation focus on process. Secondly, the creative idea (novelty) is considered an inextricable feature of creative use, while for enactment of change or technology adaptation, novelty (though possible) is not an essential outcome of the use process.

Creative use is also closely aligned to the user competence dimension of finesse (Munro et al., 1997). Defined as the "ability to creatively apply EUC", finesse embodies creativity, self-sufficiency, and ability to learn new things. Although the concepts of finesse and creative use overlap, the latter emphasizes *use* as opposed to *ability*. Finally, creative use is also distinguishable in the wider body of IT innovation research which mostly uses the term 'innovation' to refer to any technology that has been introduced into the organization, and where the research emphasis is on pre-adoption and initial use.

We are therefore confident that the concept of creative use represents a new way for IS researchers to look at post-adoption in organizations.

Research Model

Creative use in organizations therefore begins with the creative idea. Although many users may not perceive themselves as creative, research suggests that creativity is present in everyone. Given the right conditions and stimuli, all individuals (with at least normal capacities) have the potential to generate and implement creative ideas in some domain (Amabile, 1983). While not

¹ It should be noted that other factors may hinder acceptance and sustained use of the creative idea, but this is outside the scope of the current conceptualisation and study.

all users will exhibit creativity in the technology domain, there exists the potential for some users to come up with novel ways of using various features of an organization's systems to solve business problems. Given that, it only takes one good idea to make a major difference in an organization, it is important that firms are able to tap into this resource. The key question then is to determine *what are the necessary conditions for creative use, and to what extent do these factors influence the creative use of systems*.

Prior research suggests several factors related to the person, process, product and environment influence creativity. Among these factors, domain-relevant skills and knowledge is not only required for performance in a given domain - it is considered essential for achieving creative outcomes (Mumford & Gustafson, 1988; Shalley, 1991; Amabile, 1983). At the cognitive level, efficacy beliefs may also be a key determinant of creativity (Barron & Harrington, 1981). Emphasizing these two factors, Bandura's (1986) theory on self-efficacy provides a conceptual frame that brings together efficacy beliefs and domain-related skills and knowledge to explain creative use (See Figure 1).

Self-Efficacy Theory

Research suggests that domain-related knowledge and skills are a necessary precondition for creativity (Amabile, 1983). But they are insufficient when it comes to individuals being able to develop and implement creative ways of using systems. Users may not necessarily perform well, even if they know what is needed to use systems creatively. Bandura (1986) suggests that this situation is likely because self-referent thought (i.e. efficacy) mediates the relationship between knowledge and action (See Figure 1):

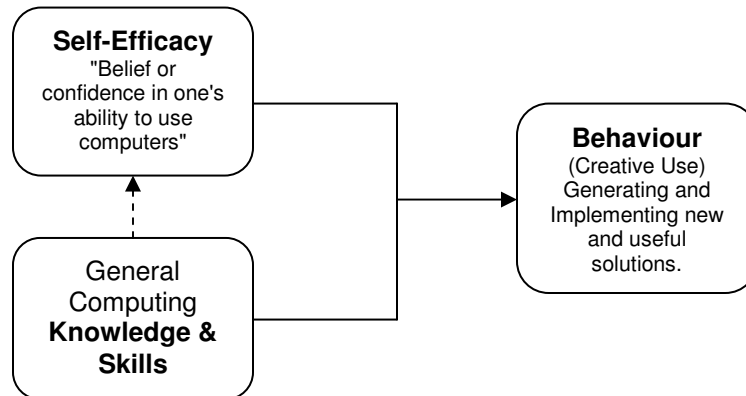
“Efficacy in dealing with one’s environment is not simply a matter of knowing what to do. Nor is it a fixed act that one does or does not have in one’s behavioral repertoire, any more than one would construe linguistic efficacy in terms of a collection of words or a colony of fixed sentences in verbal repertoire. Rather, efficacy involves a generative capability in which cognitive, social, and behavioral subskills must be organized into integrated courses of action to serve innumerable purposes. Success is often attained only after generating and testing alternative forms of behavior and strategies, which requires perseverant effort. Self-doubters are quick to abort this generative process if their initial efforts proved deficient. ...Competent functioning [therefore] requires both skills and self-beliefs of efficacy to use them effectively” (p. 390).

Bandura (1986) defines self-efficacy as a person's judgment of their capabilities to organize and execute the courses of action required to attain particular performances. Self-efficacy therefore does not focus on the skills one has, but on judgments of what one *can do* with the skills one possesses. Hence, the extent to which an individual believes they can successfully use various

computing technologies to carry out organizational tasks is a capability judgment that functions independently of their computing knowledge and skills and their expected performance.

Figure 1: Relationships between Self-Efficacy, Knowledge/Skills and Behavior.

Derived from Bandura's (1986)



Bandura (1986) goes on to argue:

“There is a marked difference between possessing subskills and being able to use them well under diverse circumstances. For this reason, different people with similar skills, or the same person on different occasions, may perform poorly, adequately, or extraordinarily.” (p 391)

Just as individuals have different skills, they are likely to differ also in the areas in which efficacy beliefs are nurtured, and the extent to which self-efficacy is developed in their chosen pursuits. Efficacy perceptions are therefore likely to vary on level, generality and strength. For example, users with high self-efficacy are likely to perform better than those with low self-efficacy, independent of their underlying skills (Bandura, 1986). Users may also judge themselves as efficacious in certain domains but less efficacious in other domains or they may judge themselves as efficacious across a wide range of domains.

Whether accurate or faulty, self-efficacy can influence what a person chooses to do - individuals will avoid activities they believe exceed their coping capabilities but confidently undertake and perform those they believe themselves able to manage. Self-efficacy may also influence aspirations, effort and perseverance under difficult situations, and whether thought patterns are self-hindering or self-motivating (Bandura, 1986). Self-efficacy is therefore applicable to understanding creative use which often requires intrinsic motivation, repeated trial and error, effort expenditure, and perseverance in the face of failure, and social and organisational impediments to creativity (e.g. Amabile 1983; 1996).

Numerous studies acknowledge self-efficacy as a useful predictor of performance outcomes. In IT research, Bandura's (1986) self-efficacy theory is also widely used to explain technology use (e.g. Compeau & Higgins, 1995b; Marakas & Johnson, 1998). Although self-efficacy has not been assessed explicitly in the context of creative use, there is evidence to suggest it may be an important precursor. For example, IS research has found that self-efficacy is an important determinant of an individual's willingness to try out new technologies, and their affect towards computer use (Ellen, et al., 1991; Hill, et al., 1987; Compeau & Higgins, 1995; Marakas et al., 1998; Lam & Lee, 2006). Research also shows that individuals with higher self-efficacy are likely to have more positive perceptions of computer technology and are likely to use it more (Venkatesh & Davis, 1996; Compeau & Higgins, 1995; Compeau et al., 1999). Self-efficacy may also influence post-adoption behaviors through effort expectancy (Venkatesh et al., 2003).

We can therefore infer from IS research and self-efficacy theory, that creative use is likely to require domain-related skills as well as the efficacy to use these skills. Hence, we hypothesize that:

H1: Self-efficacy is positively associated with the creative use of IT.

As discussed, self-efficacy alone cannot produce novel outcomes in respect of creative use, if the basic knowledge and skills for personal agency are lacking. While in the past, few users had enough computing knowledge to be able to fully utilize the organization's systems, today's users are much more knowledgeable about the capabilities of computers and the applications they are using. They are therefore likely to possess at the very least, the basic knowledge they need to derive new ways of using an organization's systems. Coupled with knowledge of the task domain, their potential to come up with creative ways of using IT has therefore been greatly enhanced by increases in computing knowledge (Mumford & Gustafson, 1988). Given that creativity requires domain-related knowledge and skills (Amabile, 1983) we can hypothesize that:

H2: Computing knowledge is positively associated with the creative use of IT.

People do not develop self-efficacy beliefs about IT without an assessment of their underlying skills and experiences (Staples et al., 1999). This assessment is likely to derive from the knowledge and skills gained through experience and training with using various technologies as well as an assessment of performance successes when using these skills (Bandura 1986). Hence, although efficacy beliefs act independently of knowledge and skills in constructing new behaviors, these judgments derive, in part, from the knowledge and skills that one possesses (Bandura, 1986; Martocchio 1994). Hence, the more computing knowledge and skills that an individual has, the more likely it is that they would exhibit higher levels of efficacy. Hence,

H3: Computing knowledge is positively associated with self-efficacy.

In summary, the research model suggests the creative use of organizational systems is likely to require computing knowledge and capabilities as well as beliefs in one's ability to use these effectively.

Methodology

Data for this study was collected using a survey administered to 537 clinical staff (e.g. medical and nursing staff and other healthcare professionals) and administrators and clerical staff (e.g. accountants, HR personnel, secretaries and other administrators) in a Health Enterprise. These staff used various technologies to carry out their work tasks. In addition to tools such as word processing, spreadsheet and database software, business process specific software were also used, including accounting packages as well as company-specific systems supporting various processes such as patient admissions/management, prenatal care, tumor registration, radiology, pharmacy operations, and equipment tracking. 'Hospital floor' staff whose work functions focused on patient care, ward duties and other 'manual' tasks were excluded from the survey. For these staff (~4500 persons) their system use, if any, was unmalleable, being constrained to and by 'chauffeured' (menu-driven) access to various systems for tasks such as patient admissions/discharges and referencing/updating patient records; they were therefore not able to use the organization's systems in new or different ways.

Of the 537 surveys administered, 225 (41.9%) were returned of which 206 (38.3%) were useable. Of the participants, 68% were female. Age ranged from 21 to 60, with an average age of 35.9 years. While 23.7% of the participants were medical staff or other health professionals, the remaining 62.3% were administrators, clerical/secretarial staff or other non-clinical professionals. Average tenure in the organization was 7.4 years; for the current job average tenure was 3.6 years.

Although the influences on creative use can come from many sources, this research focuses on the roles of domain-related computing knowledge and skills and self-efficacy. Construct measures were therefore created as follows.

Creative use. Recent work on system use emphasized the need for researchers to consider relatively rich measures that capture more or less of the system use construct in a particular context (Burton-Jones & Straub, 2006). In this study we posit such a measure focusing on *use* and *task*. Consistent with the research focus, the measures aim at capturing *the extent to which organizational systems are used in a creative way* (i.e. use) *to solve business problems* (i.e. task).

Creative use was measured using 4-items adapted from prior research (Munro et al., 1997). Although Munro et al's work posits these items as indicators of finesse, some of the items focused on the sub-dimension of creativity. Since their operationalization of the creativity sub-dimension was oriented towards the product/implementation view that underpins this research,

rather than develop new items, we reframed a subset of the finesse measure into the context of creative use, using the items as a surrogate to capture a post-hoc measure of creative use.

For each item, respondents were asked to approximate (on a 7-point scale) their creative use of organizational IT in the context of solving business problems. Sample items included "How often do you apply a computer to new and different problems?" (Never/Frequently) and "In general, how creative would you say you are in using software packages to solve business problems?" (Extremely Uncreative/Extremely Creative).

Since creative use was operationalized in a broad sense, rather than as it relates to a specific technology or system feature, the determinants were also assessed at the same level of generality.

Computing Knowledge. To date, the measurement of computing knowledge and skills generally takes the form of a list of knowledge areas and actual performance or self-assessed reports (Nelson, 1991; Torkzadeh & Lee, 2003). In this study, we used the user competence instrument to assess breadth and depth of knowledge (Munro et al., 1997).

Breadth of knowledge was assessed across the software applications, hardware, programming languages and basic computing concepts domains in which the respondent had some knowledge. Respondents were then asked to compare themselves with the average user in their firm, and record their self-assessment of breadth of knowledge on a 7-point scale ranging from "Much Narrower" to "Much Broader".

Depth of knowledge was assessed across a set of knowledge areas (e.g. word processing, spreadsheets, and organization-specific systems) and areas of General IT knowledge (e.g. security, backups, the organization's IS policies). Respondents approximated the completeness of their knowledge within each sub-domain, using a 7-point scale ranging from (1) "Very Limited Knowledge" to (7) "Complete Knowledge". Where an individual had no knowledge in a particular sub-domain, the value of '0' was assigned.

Self-efficacy is a multifaceted multidimensional construct that cannot be assessed using a collective measure - high efficacy in one context does not infer high efficacy in another (Bandura, 1986). As such, any measure of self-efficacy must reflect the domain of interest and the set of skills under consideration. Since research suggests that different skill sets (e.g. domain-related knowledge and skills, creativity skills) may be relevant to creative use (Amabile, 1988), it is likely also that different types of efficacy reflecting these different capabilities (e.g. creative self-efficacy) may influence performance over and above the effect of domain-related knowledge and efficacy (Bandura, 1986; Tierney, 2002). However, it is not the aim of this research to account for the range of efficacy beliefs and skills that impact creative use, but to focus on domain-related computing skills and efficacy beliefs. As such, the measure of self-

efficacy used here is one that reflects an individual's judgment regarding their computing capabilities (Compeau & Higgins, 1995).

Self-efficacy was therefore measured using a 10-item computer self-efficacy scale (Compeau & Higgins, 1995). For this measure, respondents were asked to indicate their level of confidence in using unfamiliar software to complete a hypothetical task under varying conditions of difficulty. Confidence levels were recorded on a 10-point scale ranging from (1) "Not at all confident" to (10) "Totally Confident".

Findings and Discussion

In this study partial least squares using PLS-Graph Version 3.00 was used to assess the measurement model and the structural model. PLS was considered more suitable than options such as LISREL and AMOS, since the latter are not suited for assessing formative constructs.

In this study, computing knowledge was modeled as formative while self-efficacy and creative use were modeled as reflective constructs. Significance testing (using bootstrapping) was used to assess the item weights for formative constructs – these ranged from 0.657 to 0.129. All items weights, were significant except one item measuring breadth of knowledge for PROGRAMMING LANGUAGES. Although this item did not contribute to the measurement model, it could be relevant in another context. The item was therefore retained in the measurement model.

The factor loadings for the reflective constructs ranged from 0.820 to 0.940. For self-efficacy and creative use (respectively), the composite reliability coefficients (0.970, 0.949) and average variance extracted (0.767, 0.824) were satisfactory. Finally, the square root of the average variance extracted exceeded construct inter-correlations, satisfying the criteria for discriminant validity (See Table 1).

Table 1: Discriminant Analysis

	Breadth	Depth	Self-Efficacy	Creative Use
Breadth	0.851			
Depth	0.639	0.869		
Self-Efficacy	0.628	0.656	0.876	
Creative Use	0.725	0.675	0.654	0.908

Note: The diagonal elements in the "correlation of constructs" matrix show the square root of the average variance extracted.

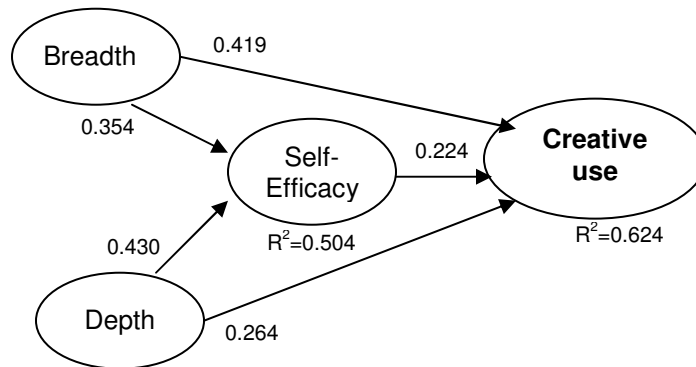
The structural model was then evaluated with respect to the explanatory power of the independent variables and the size and significance of the path coefficients. In this model, the two sub-dimensions of computing knowledge were included as independent constructs (Burton-Jones & Straub, 2006). Although computing knowledge could have been modeled as a second-

order construct, the approach used here permits us to determine if breadth and depth of knowledge have differential impacts on creative use and self-efficacy.

Consistent with expectations, the results (Figure 2) showed both self-efficacy and computing knowledge were positively associated with creative use ($p \leq 0.001$), accounting for 0.624 of the variance observed² - hypotheses H1 and H2 were supported. Consistent with hypothesis H3, computing knowledge was positively associated with self-efficacy ($p \leq 0.001$), accounting for 0.504 of the variance observed. These findings are consistent with Bandura's (1986) self-efficacy theory, which argues the link between efficacy beliefs and performance and the mediating role of efficacy beliefs regarding knowledge and skills. The study also confirms prior work on creativity (Amabile 1988), from which we inferred that creative use might be linked to domain-related knowledge.

Further analysis using bootstrap re-sampling ($n=300$) showed that breadth of capability was the stronger determinant of creative use, when compared with self-efficacy ($p \leq 0.05$) and depth of knowledge ($p \leq 0.20$). This outcome is not surprising as prior research suggests that breadth of interest may be linked to creative achievements (Barron & Harrington, 1981).

Figure 2: Model Results



Conclusion

Prior research highlights the paucity of our understanding of post-adoption use and of how individuals apply and extend the use of various systems in their work (Jasperson et al., 2005). This study aims to address this gap in our understanding of post-adoption use, in particular, the creative use of organizational technologies.

² As a check, we controlled for system use, measured as frequency of use and amount of use (i.e. hours of use). The results showed system use was distinct from all the other constructs. Although the paths between system use, and creative use, and depth and breadth of capability (but not self-efficacy) were significant, system use had little impact on the R^2 .

This study therefore contributes to IS research work by offering a new approach to examining post-adoption use that is, creative use, and then examining the concept within a network of key influences. The findings showed that computing breadth and depth of capability as well as computer self-efficacy influence creative use. Of the three influences, breadth of capability was the more dominant.

This research also contributes to a better understanding of the research initiated by Munro et al., (1997) on finesse by reframing and extending the earlier work into the context of creative use.

For organizations, the findings suggest that if they wish to foster the creative use of systems they should not only pay attention to the knowledge and skills that an individual has but also to personal factors such as the level of confidence they bring to bear upon system use. Given the dominance of breadth of knowledge in influencing creative use, it may be important that organizations expose users to a range of technologies, even though not all of these might be used for their particular job function.

Data for this study were collected using self-assessed evaluations of the key constructs. However research shows that respondents often overstate their computing capabilities when using self-assessed measures (Marcolin et al., 2002). Although users may have an inflated view of their capabilities, this may serve to enhance performance (Bandura, 1986). However, if their assessment of capabilities is too over-inflated, then the link between capabilities, self-efficacy and creative use may become void. More objective measures of capabilities may therefore be useful.

This study also relied on existing scales to assess the relevant constructs. However, these items are not the only way nor might they be the best way, to measure these multifaceted constructs. Future research should therefore consider alternative measures of self-efficacy and creative use.

Finally, research suggests creativity is present in every individual, but most organizations nurture it in few of their employees - the greater potential therefore lies latent and untapped in most people. The challenge for organizations and for future research is to determine what other behaviors, abilities, factors or events would encourage people to seek new ways to employ the organization's technologies. For example, use history and cognitions such as performance expectancy and social influence as well as organizational variables such as culture, work group support, and freedom/autonomy may influence creative use (Amabile et al., 1996; Jasperson et al., 2005; Venkatesh et al., 2003). Further work is therefore needed to enhance understanding of creative use.

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